

NASA Technical Memorandum 89605

Publications of the Exobiology Program for 1985

A Special Bibliography

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A Special Bibliography

*The George Washington University
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INTRODUCTION

The Exobiology Program, within the Office of Space Science and Applications of the National Aeronautics and Space Administration, is an integrated program to methodically investigate those processes that may have been responsible for, or related to, the origin, evolution, and distribution of life in the universe.

This report contains a listing of 1985 publications emanating from research supported by the Exobiology Program. Our intent in compiling this report is twofold: we want to provide the scientific community with an annual publication listing (as we have done since 1975) of current NASA-supported research in this field, and we hope to stimulate the exchange of information and ideas among scientist working in the different areas of the program.

Research supported by the Exobiology Program is explored in the areas of Chemical Evolution, Organic Geochemistry, Origin and Evolution of Life, Planetary Environments, Life in the Universe, and Search for Extraterrestrial Intelligence (SETI).

EACH AREA IS DEFINED AS FOLLOWS:

CHEMICAL EVOLUTION focuses on the non-biological synthesis of biologically significant organic molecules under conditions presumed to have existed on the primitive earth or on any primitive planet before the advent of life.

ORGANIC GEOCHEMISTRY involves: 1) analyzing ancient terrestrial rocks for organic molecules and inclusions of biological origin, and 2) developing techniques to isolate organic matter of biological origin from that of non-biological origin.

ORIGIN AND EVOLUTION OF LIFE includes studies of: 1) the origin of essential life processes and systems including the nucleic acid and protein biopolymers, mechanisms, genetic information transfer, energy collection and cellular and subcellular structures, and 2) the evolution of primitive microbial ecologies.

PLANETARY ENVIRONMENTS includes: 1) characterizing microorganisms capable of surviving and/or growing in extreme conditions approaching those of planetary environments, 2) developing methodologies and techniques to detect and characterize life-related molecules in extraterrestrial environments, and 3) developing methods to determine planetary environmental characteristics important for chemical evolution processes.

LIFE IN THE UNIVERSE involves research and analysis in two distinct but related areas: 1) forms, abundances, and reactivity of the biogenic elements and 2) effect of planetary, solar, and astrophysical phenomena on evolution of complex life.

SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) involves the search for extraterrestrial intelligent life by detecting signals in the microwave region of the spectrum.

This bibliography is divided into the six research areas noted above and a miscellaneous section. Within each research area, references are listed alphabetically by author. Authors who are principal investigators are identified by an asterisk. In addition, current addresses for all Principal Investigators are given in the Appendix.

We wish to thank all the participants in the Exobiology Program for their cooperation in responding to our request for a listing of their 1985 publications.

Donald L. DeVincenzi
November 1986

CHEMICAL EVOLUTION

BANIN*, A.; LAWLESS*, J.G.; MAZZURCO, J.; CHURCH, F.M.;
MARGULIES, L.; ORENBERG*, J.B.
pH Profile of the Adsorption of Nucleotides onto Montmorillonite.
II. Adsorption and Desorption of 5'-AMP in Iron-Calcium
Montmorillonite Systems.
Origins of Life
15(2): 89-101, 1985.
(GWU 6478)

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The Determination of Protein Structure with
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In: Mass Spectrometry in the Health and Life Sciences
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(GWU 6693)

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The Radiolysis and Radioracemization of Amino Acids on Clays.
Origins of Life
15(2): 103-114, 1985.
(GWU 6448)

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In: Chemical Events in the Atmosphere and Their
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International Journal of Peptide and Protein Research
25(3): 225-231, 1985.
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A Possible Energetic Role of Mineral
Surfaces in Chemical Evolution.
Origins of Life
15(3): 161-206, 1985.
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Photolysis Products of CO, NH₃ and H₂O and Their Significance to Reactions on Interstellar Grains (Abstract).

In: Second Symposium on Chemical Evolution and the Origin and Evolution of Life, NASA Ames Research Center, Moffett Field, CA, July 23-26, 1985.

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(GWU 6779)

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Laboratory Simulations of PH₃ Photolysis in the Atmospheres of Jupiter and Saturn.

Icarus

62: 415-424, 1985.

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Photochemical Reactions of Various Model

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A Titan Simulation (Abstract).
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(GWU 6967)

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(GWU 6970)

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on Mineral Surfaces.
Journal of Molecular Evolution
21(3): 299-300, 1985.
(GWU 6634)

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Science
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Precambrian Research
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Methane, Nitrogen and Water - The Possible
Role of Chemical Evolution.
Kexue Tongbae
30: 281, 1985.
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Journal of Molecular Evolution

21(4): 351-355, 1985.

(GWU 6635)

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In: Second Symposium on Chemical Evolution and the Origin and Evolution of Life, NASA Ames Research Center, Moffett Field, CA, July 23-26, 1985.

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ORGANIC GEOCHEMISTRY

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In: Abstracts, 1985 Pittsburgh Conference and Exposition
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Economic Geology
80(2): 270-282, 1985.
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Microbial Metabolism.

Applied And Environmental Microbiology
50(4): 996-1001, 1985.
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An Investigation of the Nitrogen Isotopic Composition
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In: Abstracts, British Isotope Geology Group
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Cambridge, England: University of Cambridge,
Department of Earth Sciences, p. 3, 1985.
(GWU 6621)

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Amino Acids of the Murchison Meteorite: II. Five Carbon
Acyclic Primary Beta-, Gamma-, and Delta-Amino Alkanoic Acids.
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49(11): 2259-2265, 1985.
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Carbon Exchange Between the Mantle and the Crust,
and Its Effect Upon the Atmosphere: Today Compared
to Archean Time (Abstract).
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In: The Carbon Cycle and The Atmospheric CO₂: Natural Variations Archean to Present (Geophysical Monograph 32).
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Earth's Early Atmosphere as Seen from Carbon and Nitrogen Isotopic Analysis of Archean Sediments (Abstract).
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(GWU 6619)

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